

Embracing the Local: Enriching Scientific Research, Education, and Outreach on the Texas–Mexico Border through a Participatory Action Research Partnership

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Cameron Park, Texas, is a *colonia* (an isolated, unincorporated rural settlement without municipal improvements) on the Texas–Mexico border in the Lower Rio Grande Valley, in Cameron County near Brownsville, Texas. Cameron Park has a population of 5,961 residents, 99.3% of whom are Hispanic. The annual median income is \$16,934, about one-half of the state median. Fifty-eight percent of families generally and 68% of those with children younger than 5 years have incomes below poverty level. Cameron Park resides geographically in a region where agriculture has been, and continues to be, a dominant industry, a fact consistent with the intensive use of pesticides and increased potential for air, water, and ground contamination. The practice of good environmental health is extremely difficult under these conditions. In 1999 the Texas A&M University Center for Housing and Urban Development's Colonias Program and the Center for Environmental and Rural Health teamed up to create an environmental health education and outreach program called the Cameron Park Project (CPP). The CPP focused on how to reduce potential environmental exposures associated with human illness by providing residents with scientifically sound information on positive health practices and how to deal with environmental hazards. In this article we discuss the research methodology used in the CPP, a methodology specifically chosen to address four challenges presented by *colonias* to conducting valid and reliable research. **Key words:** border health, *colonias*, environmental health education, participatory action research, *promotoras*, Texas–Mexico border. *Environ Health Perspect* 111:1571–1576 (2003). doi:10.1289/ehp.5771 available via <http://dx.doi.org/> [Online 27 May 2003]

Cameron Park, Texas, is one of approximately 1,800 *colonias* (unincorporated, irregular rural settlements lacking water, sewer, and improved roads and extremely isolated geographically, economically, and socially) on the Texas–Mexico border. It is located in the Lower Rio Grande Valley, in Cameron County, and situated geographically within the Brownsville, Texas, metropolitan area. Cameron Park today remains an unincorporated settlement with little by way of physical, social, or economic infrastructure. Only within the last 5 years have safe water and hard-surface roads become a part of daily life in this community, which still lacks developed waste disposal and drainage. Cameron Park has a population of 5,961 residents, 99.3% of whom are Hispanic. The annual median income is \$16,934, about one-half of the state median. Fifty-eight percent of families generally and 68% of those with children younger than 5 years of age have incomes below poverty level (U.S. Census Bureau 2002). The community resides geographically in a region where agriculture has been, and continues to be, a dominant industry, a fact consistent with the intensive use of pesticides and increased potential for air, water, and ground contamination. The practice of good environmental health is extremely difficult under these conditions.

Environmental health hazards related to exposure to environmental contamination have been documented as a health and social concern along the U.S.–Mexico border. Garcia et al. (2001) noted that pesticides continue to be associated with increased risks of major congenital malformations, as reported in several extensive environmental monitoring programs in the Lower Rio Grande Valley. Garcia et al. (2001) also noted that in a small-scale U.S. EPA study that monitored indoor and outdoor air, food, house dust and soil,

low levels of pesticides were detected in each of the media sampled, except public drinking water, with higher levels of pesticides found in the summer.... Mukerjee et al. (1997) observed agricultural pesticides (e.g., malathion and chlorpyrifos) in both outdoor and indoor air, while the concentrations of household pesticides (e.g., chlordane, chlorpyrifos, diazinon, and heptachlor) were generally higher indoors than outdoors. They also found levels of volatile organic compounds, such as propane and butane, and polycyclic aromatic hydrocarbons to be higher indoors (Mukerjee et al. 1997).

Responding to Environmental Health Concerns

In 1999, the Texas A&M University Center for Housing and Urban Development (CHUD) Colonias Program and the Center for Environmental and Rural Health (CERH) teamed up to create an environmental health

education and outreach program called the Cameron Park Project (CPP). Both organizations brought a wealth of experience to the project. The CHUD Colonias Program had worked for nearly a decade helping to bring health and human services to *colonias* residents, and the CERH directed an active community outreach and education program dedicated to educating rural communities in Texas. This program focused on how to reduce potential environmental exposures associated with human illness by providing residents with scientifically sound information on positive health practices and how to deal with environmental hazards.

One objective of the CPP was to provide environmental health education based on solid scientific information and best practices for preventive health care. A second objective was to assess what Cameron Park residents knew about environmental hazards and health before and after the CPP education and outreach intervention. A third objective was to use a scientific research methodology that addressed challenges presented by *colonias* conditions to conducting valid and reliable research. In this article we report on the third objective and its outcomes.

Designing the CPP: Four Challenges

The creation of the CPP required considering a set of four challenging conditions in the *colonias* and finding a methodology to meet and embrace the challenges into the design of the research, education, and outreach. The first challenge was in the nature of *colonias* themselves. The U.S. EPA defines *colonias* as “U.S. rural settlements with substandard housing and poor living conditions along the U.S.–Mexico border” that may lack some or all of the following: paved roads, sewer systems, electricity, gas, clean water, and/or health care services (Browne et al. 1994; U.S. EPA 2001; Ward 1999). *Colonias* are frequently in rural areas with low population density, a fact

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that helps explain why they are so often without infrastructure. According to P.M. Ward (1999), *colonias* exist in an “administrative no man’s land,” and thus the communities fall through the cracks politically. They are not within the jurisdictional governance of regional cities, nor are they attended to with any care by county governments. Only very recently has the state begun to put some funding into physical infrastructure. Without question, *colonias* have been, and continue to be, isolated and largely ignored geographically and politically. This fact alone made it difficult to gain trusted and legitimate access to conduct research in *colonias* communities.

Our second challenge was that *colonias* residents have little formal social, political, or economic agency, which only deepens their isolation. In Cameron Park, for example, 35% of the residents, although documented, are not U.S. citizens, and therefore cannot vote (U.S. Census Bureau 2002). Those who work with *colonias* residents estimate that approximately another one-third are undocumented residents, although no direct data sources substantiate this number. Most *colonias* residents also feel the marginalizing effects of poverty and low levels of education relative to surrounding populations. The majority of *colonias* residents have little to no voice politically and socially.

Another characteristic of *colonias* residents that presented our third challenge to designing the CPP was identified by Duncan Earle in “The Border *Colonias* and the Problem of Communication: Applying Anthropology for Outreach” (1999). Earle was not a *colonia* resident but worked regularly with *colonias* residents in community development and conducting research with the community. One of his conclusions was that

... communication is not on the whole very good, either with outsiders or among *colonia* residents. Relations between residents and service providers are generally characterized by lack of trust, mutual suspicion, and the idea that the other side is hiding something or “pulling something over.” This despite cordial interaction. This social rift is not ethnic for the most part. The vast majority of the informants interviewed were Hispanic, both *colonia* residents and service workers. The differences between them were class based, and notable in terms of amount of acculturation and degree of integration into the U.S. system.

For us, finding a methodology that provided reliable communication with wary residents was essential for the project to succeed.

Finally, the nearly 10 years of experience of CHUD’s *Colonias* Program working with *colonias* communities and residents clearly indicated that the most effective (perhaps only) means of genuinely gaining the trust and engagement of residents was to work “from the inside out.” In other words, our fourth challenge was to find ways to engage residents by partnering with them and local organizations,

both inside and outside the *colonias*, in a manner that honestly involved them in the discussions, planning, and implementing whatever program was under consideration. From the experience of the *Colonias* Program, we found that working from the inside out cohered residents, encouraged and facilitated engagement, generated interest and desire to participate, and developed skills and leadership within the community. In the long run, this approach enabled residents to invite outsiders to bring their resources into the community, for the benefit of the community.

Methodologic Issues: Philosophical and Practical

The conditions described above demanded that we choose our methods carefully both to respect the local challenges and to assure that the research, education, and outreach would be rigorously and successfully completed.

Gaining trusted entrance and reception was essential for the CPP; therefore, choosing effective means of communication was paramount. Communication media common in the larger society—TV, radio, printed brochures (even in Spanish), and other forms of printed announcements—did not interest and/or catch the attention of *colonias* residents. This fact was exacerbated when the persons or organizations using such means were from outside the community. Earle (1999) frames the problem as one related to communicating across cultural boundaries. Communicating within cultural boundaries enhances understanding without explanation, because the assumptions within which the communication originates are agreed upon.

Outside our own culture, the assumption about communication (metacommunication) breaks down, and what one side sends is not received in the same way by the other side. They fail to share metacommunicative repertoires, common understandings about what constitutes legitimate forms and contexts and implications of communication. The result of such “ships passing in the night” frequently is mutual loss of respect and trust. Each side thinks the other stupid or crafty or both. (Earle 1999)

To address this, and other *colonia*-research-related issues, we chose to build on a program that the *Colonias* Program had successfully developed. Central to the *Colonias* Program’s gaining an effective and trusted presence in *colonias* was the creation of a cadre of lay outreach workers called *promotoras*. *Promotoras* are indigenous lay community-health and outreach workers. They are selected from the *colonias*, hired by the *Colonias* Program as Texas A&M employees, and provided extensive training. *Promotoras* have proven to be knowledgeable intermediators between *colonias* residents and persons and organizations outside the *colonias*, for example,

providers of many types of services needed by residents. *Promotoras*’ work is diverse. In 2002, we (May et al. 2002) documented the effectiveness of *promotoras* in *colonias* and identified five general domains of practice in *promotoras*’ roles: information and referral, education, emotional support, community and capacity building, and advocacy. Of special interest for the CPP were the roles of information and referral and education practices that we described (May et al. 2002) as bridging cultures. *Promotoras* bridge community residents in two ways: horizontally, by facilitating social networks within the community, and vertically, by connecting *colonias* residents with critical services from outside the community. *Promotoras* are translators and interpreters.

They not only take knowledge of the community and translate with service providers; they take knowledge of the service providers and translate it with community residents. “Translating” between two, often contradictory, worlds requires that C-HWs [*promotoras*] have dual competency, capacity for understanding and communicating in ways few others have. (May et al. 2002)

Promotoras, it seemed, would be a natural choice for participating with us in both the education/outreach and the research parts of CPP.

Education and outreach. To prepare *promotoras* to conduct community education and outreach regarding environmental health, the CPP primary investigator and co-investigators used a train-the-trainer model, as previously described (Ramos et al. 2001). Briefly, in 1999, the CERH, the CHUD, and the South Texas *Promotora* Association worked together to develop and implement a pilot program that would use research, education, and outreach in the evaluation of sustainable environmental health in the *colonias*. This program was based on an environmental health curriculum and used a “train-the-trainer” model of education and outreach. As we stated previously (Ramos et al. 2001),

[The program] was designed to teach *promotoras* working in *colonias* about the environment and about environmental health and to prepare them to teach their neighbors what they have learned.

On the basis of data from the Texas Department of Health and the Centers for Disease Control and Prevention (CDC) regarding environmental health conditions along the U.S.–Mexico border, a bilingual curriculum was developed, with content based on a preintervention assessment of health concerns of *colonia* residents. The authors set instruction at the middle school level so that individuals with varying educational backgrounds would be more likely to understand the scientific and medical principles. The *promotora* training was carried out at *colonia* community resource centers (Ramos et al. 2001).

Once the *promotoras* completed the education/outreach training, the next step was to devise a plan by which they would educate their neighbors. In two additional training sessions, *promotoras* worked with the principal and co-investigators to create a community education outreach strategy and a set of pedagogical tools to implement that plan. The community education outreach strategy developed in the first session called for *promotoras* to organize and implement a series of environmental health community outreach education seminars (COES) throughout the community in the community resource centers, in meeting halls of churches and organizations throughout the community, and in homes. In the COES, the *promotoras* made presentations and led discussions that informed resident participants about environmental health issues in their community and possible positive strategies that would help protect against these health hazards. The second training session involved interactive activities for devising and practicing pedagogical skills to sharpen teaching techniques and enhance self-confidence in making presentations and leading discussions. The *promotoras'* previous training and experience as lay community-health and outreach workers in the Colonias Program were valued assets in two ways. First, they had some communication skills and techniques upon which to build. Second, they already knew their community and therefore were invaluable in evolving a strategy of education/outreach that made sense.

That all parties recognized the personal benefits to be gained facilitated these sessions, as well as the entire training process. The *promotoras* valued the CPP because it provided a direct benefit to their community. Conversely, the primary investigator and co-investigators valued the participation of *promotoras* because they were community residents and provided a trusted, indigenous means of engaging *colonias* residents in the community education/outreach and the research, something we as outsiders could not have done well. *Promotoras* as research team members facilitate strong partnerships among *colonias* residents, university researchers, public health specialists, and clinicians (Ramos et al. 2001).

Essentially, the community educated itself from the inside out, using methods of communication that it understood and trusted.

Community-based research. Building outreach around indigenous educators improves the chances of reaching and educating community residents, we believe, but does not guarantee success. Therefore, to measure the extent to which residents had learned from the outreach, inclusion of an assessment research component in the CPP was important.

Given the challenges to the CPP described above, we concluded that, as outsiders, trying to conduct interviews ourselves would only

heighten any barriers that already existed and, in the end, would call into question the validity and reliability of the research results. We chose, therefore, a research methodology called participatory action research (PAR). PAR methodology is constructed on four integrated processes—planning, action, observation, and reflection—that continue in successive cycles until research objectives are attained. Each successive cycle builds upon the previous one, integrating results from the former cycle into planning and action of the next cycle. Weissberg and Greenberg (1998) explained that this research methodology operates from an ecologic approach, involving practitioners, residents, researchers, and other active members of the research context. This assures that the research design and implementation take advantage of the strengths, competencies, and potential promises in the research setting. The outcomes are relationships and continued communication long beyond the actual research project, and richer validity of the research outcomes. PAR suits well the context of the *colonias* because it addresses the communication challenges and issues of trust presented to the CPP.

Using PAR also allowed us to address several important philosophical issues raised when conducting community-based research in *colonias*. One of those philosophical issues was how, in the context of the challenges presented by *colonias*, local, particular knowledge could be validly and reliably retrieved. Although this issue is always present in research, it becomes a major test in *colonias*. In part the question is one of gaining entrance, legitimacy, and trust among the residents; however, how to retrieve local knowledge with minimal distortion and/or reconstruction is also a concern. The epistemologic problem here is akin to an issue raised by Heisenberg as a problem of complementarity in knowledge production (Heisenberg 1972a, 1972b, 1972c). The problem, Heisenberg asserted, is that the research “instrument” used to gather data has a potential transforming effect upon what is observed. Applied in the context of the *colonias* and gathering qualitative data for this research, the challenges were to *a*) identify those best suited to gathering and interpreting local knowledge; *b*) decide who qualified as an expert; and *c*) agree on the meaning of objectivity. Failure to address these issues could undermine the reliability and validity of the local knowledge gathered.

In traditional academic scientific research, the primary assumptions are that professional researchers are the experts, the seekers and receptacles of knowledge, trained to be objective through years of education and practice aimed at removing all that is personal and particular from the data, the context from which it comes, and the analysis. Further, the

assumption is that knowledge gained in this fashion strives toward universality (i.e., is removed from its local context, stripped of its particularity, and transformed into knowledge applicable beyond local and regional particularities). These assumptions are grounded in some form of a positivist epistemology.

In the CPP, and in deciding to use the PAR methodology, we privileged different epistemologic assumptions that better fit the CPP. Our understanding of objectivity gave primacy to objectivity rooted in the concept of *verstehen* (Weber 1949), which asserts that objective knowledge is knowledge laced with local meanings and is produced from, rooted in, and connected to the local context. Privileging *verstehen* led logically to expanding the definition of “expert” in the context of our project. If *verstehen* objectivity incorporates the particular and its meanings, then locals can and should be recognized as experts in their own right, in addition to and distinct from the professional researchers as experts. As experts, locals are both the bearers and gatherers of legitimate knowledge. Pena and Gallegos (1997) captured the essence of this methodologic idea:

Collaborative research must be governed by emic values, that is, the true claims and procedures for gathering knowledge that are generated by the community of local participants. Emic values are necessary for understanding the strategy underlying collaborative research, since local people are involved not as “informants” or “subjects”, but as co-investigators who define the research question and develop methods for generating evidence. In the context of environmental action research, collaboration must be based on recognition of local knowledge as the fundamental basis for building an understanding of ecosystems and watersheds. The research procedures must go toward building the transference of research skills from the scholar to local participants.

Having made these points, it is important to note that in applying PAR and the methodologic philosophies underlying the CPP, we did not lose sight of the traditional tenets of scientific research. First, the professional, trained researchers were still full research participants alongside the local collaborators, engaged and active at every phase of research. Further, we emphasize that PAR is a theory-based methodology, a central requirement of the traditional research paradigm. PAR intends to expand theory by holding the professional researchers, and their knowledge, in a tight, reflective dialectic with local knowledge and local experts. The PAR establishes a counterpoint relationship in which professional university-based scientific researchers with their penchant for universal knowledge work closely and collaboratively with community-based researchers and their penchant for particular knowledge. The process exposes professional researchers and their scientific knowledge to substantive

incongruities, inconsistencies, and inaccuracies exposed in the context of local knowledge and experts. Conversely, the counterpoint exposes the locals' particular knowledge and experience to a broadening perspective of the professional researchers' abstract knowledge.

This, then, is the philosophical and methodologic framework under which the CPP research team was constituted.

The CPP in Action

The CPP research team consisted of eight *promotoras* from Cameron Park and three principal and co-investigators from Texas A&M. The *promotoras* were included in multiple stages of the research. The research design was developed around the education/outreach intervention, and as that curriculum was developed collaboratively with the *promotoras*, the content of the research design was also collaboratively defined.

An example of that collaborative process is the development of the research instrument—the interview protocol. The protocol questions were initially constructed by a co-investigator, after which it was reviewed and critiqued by the *promotoras*, who were the research interviewers. The process was as follows. One of the co-investigators and two local staff members of CHUD's Colonias Program designed a 3-day training seminar with three major objectives. First, the training seminar involved the *promotoras* in reviewing the protocol questions, inviting their feedback as to whether the questions were relevant to the project and whether they were well stated. The second purpose of the seminar was to train the *promotoras* in research interviewing techniques. The *promotoras*, now familiar with the questions, were required to conduct a series of mock interviews in which they were critiqued by the other *promotoras* and the trainers. The training provided valuable feedback about the validity of questions and about interviewing techniques in the specific context of a *colonia*, and revisions were made as consensus deemed important. *Promotoras* were clearly both learners and teachers throughout the training seminar, and the final interview protocol and process were rendered more reliable and valid because of their input.

After the interviewer training, the *promotoras* then participated with one of the co-investigators and a CHUD Colonias Program staff member in finalizing the design for carrying out the interviews. *Promotora* involvement included participation in sampling and in development of research strategies. For example, it was determined that *promotoras* would always work in interview teams. In addition to providing security for *promotoras* moving about the community, this measure also created a productive research strategy in which the *promotoras* alternated between conducting the interview and manually recording the answers.

After each interview, the team would review and complete the interview narrative.

Research roles. Working with *promotoras* as research collaborators, we as professional researchers had to confront several aspects of conducting research we had not previously encountered, and we had to reconsider traditional views—specifically, regarding questions of research roles.

Involving *promotoras* as researchers meant that the role of local participants must necessarily be understood as more than that of informant, because they were in fact full collaborators in the research process. They were participants in designing the instrument, shaping the field research agenda, interviewing *colonias* residents, and analyzing and interpreting the data. The professional academic researchers were trainers, confidants, project managers, and sounding boards, whereas local residents were interviewers, data quality control monitors, and research designers. Throughout this process, a partnership evolved whereby professional and local researchers each contributed their unique knowledge and expertise, alternately acting as teachers and learners with each other.

Such collaboration will continue into the data analysis and interpretation, which we are just beginning. *Promotoras* will provide input about analysis of the data they collected, just as they did in identifying the research problems and carrying out the interviews. The principal and co-investigators and/or graduate students will provide much of the direct analyses of data. The *promotoras* will review drafts of analysis results as they are produced and provide their interpretative input.

In addition to changing research role perceptions, involving locals in research roles also opened up two other philosophical issues. The first issue concerns who qualifies as an expert and how authority should be assigned. As inclusion of local participants as research collaborators proceeded, differences in opinion—sometimes sharp—had to be confronted and resolved (e.g., differences about decision-making authority on issues of research strategy, the scheduling of interviews, how community residents should be approached and what they should be told about the project, and how benefits to the community would be realized). From those problems and their resolutions arose the conviction that, in the research process, we should listen to two types of research experts—external/generalist experts and indigenous/particularist experts, both of which have their specialized competencies and contributions and both of which are crucial to valid and reliable knowledge.

Another issue concerned the matter of the control of research and of the knowledge produced. Who had authoritative control over the gathering, analysis, and ultimate dissemination of knowledge? In the traditional

research paradigm, the professional academic researcher possesses primary control over the research process and over where, when, and in what form knowledge will be disseminated. That model did not fit comfortably in the CPP. Because local residents and communities shared collaborative responsibility for research design, implementation, and analysis, local participants staked a claim to share in decisions about when, where, and in what form that knowledge would be disseminated. By no means is this claim exclusive; rather, the claim is to share determinations, because the uses and dissemination of what was once solely resident property (i.e., local knowledge and community) are at stake.

Judging the CPP as a Model of PAR

One measure of the success of CPP as a model of PAR is the degree to which we were able to create and sustain a working environment that simultaneously recognized and respected the legitimacy of locals and outsiders, of nonprofessionals and professionals, and of particular and universal knowledge in the research process. As a way of judging the CPP, we set out a logic model (Figure 1) as a measuring tool.

In Figure 1, the logic of the traditional scientific research process is expressed by the following elements: theoretical knowledge (scientific theory)→research questions (hypotheses generation)→data gathering→conceptual generalizations→and, finally, incorporation of the generalizations into, and thereby the expansion of, theoretical knowledge and hypothesis development. In this logic, research is tied inextricably to a larger, abstract body of scientific theory generated by generations of scientists through formally designed and controlled research methodologies. In Figure 1, there are four other elements: local knowledge→problem-based/action questions→data gathering→conceptual particularization, and finally, incorporation of the particularizations into, and thereby the

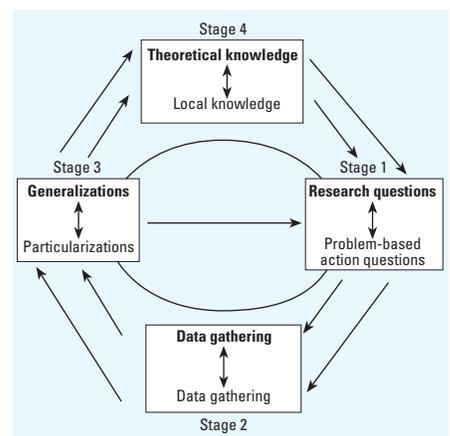


Figure 1. PAR logic model.

expansion of, local knowledge and community problem solving. Together, the two kinds of elements shown in Figure 1 are necessary for a genuine PAR methodology. But—and this is absolutely essential—the condition that those elements must generate is a sustained dialectic between and among the opposing elements in each stage of the research process logic model.

Using Figure 1 as the measure, the CPP can be judged as largely successful. In stage 1 (research questions/problem-based action questions) the dialectic worked well. The research questions generated further questions from both the scientific literature on environmental health and hazards and the social science literature on environmental policies and socioeconomic and cultural variables related to environmental health and health conditions in the *colonias*. At the same time, problem-based questions were generated from community participants related to specific environmental hazards and conditions in Cameron Park specifically and the *colonias* more generally. The problem-based questions were in part an outgrowth of the collaborative work in the education/outreach part of CPP.

For stage 2 (data gathering), the narrative thus far clearly illustrates that a strong dialectic was established and sustained in the data gathering stage. But that is only part of the sustained dialectic. Just as important is the fact that between collaboratively generating research and problem-based questions (stage 1) and data gathering (stage 2), professionals and locals engaged in a prolonged process of interview protocol development. This was an informative and formative experience for all participants, including the professional researchers.

We have just recently moved to stage 3 (generalizations and particularizations). The data are entered, cleaned, and ready for analysis. Over the next several months, graduate students, guided by the principal and co-investigators, will conduct descriptive analyses. At that point, local participants will enter the process. The descriptive results will be presented, and extended discussions of the results will follow. In part, these exchanges between local participants and professionals will focus on questions of descriptive content, noting discrepancies and returning to the data for further clarification. Iterations of this process will occur until all are satisfied that the descriptive

data are understood. However, this process will also include exchanges of ideas about the meaning and interpretation of these data. These exchanges will produce further refinement of the research and problem-based action questions to be analyzed. This, too, will be an iterative process, continuing to produce generalizations and particularizations.

During stage 3 of the process, considerations related to stage 4 (theoretical/local knowledge) will also enter the discussion. Together local participants and professionals will explore relevancies and applications of the generalizations and particularizations to both the larger body of literature and community-based problems. The professionals will have the primary leadership role in regard to literature, whereas the locals will hold leadership for the discussion of particular community-based problems to which the generalizations and particularizations apply. The intention is that in this process the local researchers will learn something valuable about the larger body of scientific literature and the professional researchers will learn something profound about the particular community-based problems and how the results of this research relate to them.

In addition to the model in Figure 1, the outcome of CPP as a model of PAR might be measured by another set of criteria at work in the research process. The first criterion pertains to who plays the role of an expert; the second criterion relates to the locus of the power to control in the research process. This latter criterion has three subdimensions: *a*) input control before any research is designed (i.e., whether research should be allowed at all in a particular community, and if it is allowed, who decides on how, when, and where it will be done); *b*) process control during research (i.e., decision making about research design, methodology, research personnel, data gathering, research questions, how data analysis and interpretation is done and by whom); and *c*) outcome control after the research has been conducted (i.e., decision making about how, when, and where knowledge is presented and used). Figure 2 illustrates these criteria as continua. The poles of each continuum represent extreme positions, with the left poles representing conditions in which professional researchers are sole experts and solely in control of the research process,

and the right poles representing conditions in which local researchers are in sole control. Hypothetically, the position that best represents PAR is the center of each continuum.

The reality, we discovered, is that a constant, sustained center position (zero point) does not exist in the research process. At best, the research process can strive for an average position in the center of the continuum. In the CPP, the balance of one or another of these criteria fluctuated in practice. In stage 1, the CPP started out heavily weighted to the left, with the principal and co-investigators firmly in control and acting as the experts. This situation prevailed through an initial writing of a concept paper and a proposal, after which the professionals started the process of entering the field and meeting with locals. (This all occurred in the early phase of stage 1.)

Once we entered the field, however, the dominance of professionals or locals alternated. For example, after the research and problem-based action questions were formulated in stage 1, one of the co-investigators became the dominant expert, taking near total control as he developed an initial draft of the interview protocol. At the completion of the protocol draft, the locals became dominant as experts and controlled input as the protocol questions were refined and the instrument as a whole was designed. When disagreements arose regarding meaning, discussion persisted until a reasonable consensus was found. In stage 2, the locals were the experts and were very much in control of the interviews and interview processes. Their input and feedback to the professionals maintained quality control of the interviews and kept the data gathering organized and on track. Throughout the research process, tensions developed and disagreements arose, which in most cases were resolved by consensus building among the participants.

Conclusion

The PAR methodology worked well in the CPP. There is, however, one other value not yet noted. The earlier discussion of challenges to conducting research, education, and outreach in *colonias* identified ways in which *colonias* and their residents are isolated and have minimal political and social agency. PAR and its inclusion of local participants and knowledge engendered agency among residents, and particularly among the *promotoras*. The CPP brought new research and pedagogical skills to *promotoras*. The hope is—yet to be tested in the upcoming data analysis—that it brought new knowledge to community residents. As one *promotora* stated it,

When we started the project I dreaded coming because I was sure it would all be in English. Then when I found out that we would be using both Spanish and English, I thought for sure that the

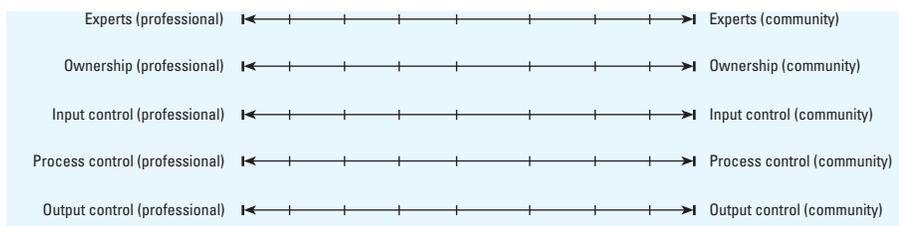


Figure 2. PAR process and outcome criteria.

information would all be information brought by you academics. Then I found out that we could be involved in saying what we thought was important for our community to know. I liked to be a part of this project and to be able to learn and share with others. I have learned a lot. I like doing interviews.

It is also significant that one of the *promotoras* involved in the CPP has been hired as the lead *promotora* in a replication of the CPP in another *colonia*. She is assisting *promotoras* in the new community to design the project for their community.

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